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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHOI, WOO H

ART UNIT

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2189

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/702,137	Applicant(s) STEINMETZ ET AL.	
	Examiner Woo H. Choi	Art Unit 2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1 – 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not seem to describe a virtual disk having virtual sectors of a second sector length wherein the second sector length refers to data payload lengths of physical sectors. According to paragraph 174 (PGPUB No. 2004/0148461) of the published application, 520-byte virtual sector seems to be a logical sector. The specification does not seem to disclose that this logical sector refers to data payload of a physical sector. The specification does not disclose how this logical/virtual sector is related a physical sector of any kind. Moreover, figure 44 makes it clear that the virtual sector (520 bytes) includes the data payload (512 bytes) and overhead data (8 byte LRC). The Examiner asks Applicants to provide support for this limitation from the original specification by referring to specific sections and/or drawings if any.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 1 – 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. All independent claims recite the limitation “a virtual disk having virtual sectors of a second length ... wherein ... the second sector length refer to data payload lengths of physical sectors.” It is not clear what it means for a virtual sector length to refer to data payload lengths of physical sectors. For the purposes of this examination, the virtual sector length limitation will be interpreted as being related to data payload length of physical sectors.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 4 – 6, 13, and 16 – 18 rejected under 35 U.S.C. 102(b) as being anticipated by Colligan (US Patent Application Publication No. 2002/0065982).

7. With respect to claims 1 and 13, Colligan discloses a virtual disk formatting system comprising (figure 1):

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a plurality of mass-storage devices (figure 1, 180, 185) having physical sectors of a first sector length (page 5, paragraph 44, 512 bytes); and

a routing component (175, routes disk I/O commands/requests to floppy or hard drives as appropriate) that provides a virtual disk interface to the mass-storage components by routing each access operations, received from external entities, directed to a virtual disk having virtual sectors of a second sector length (paragraph 44, 1024 bytes) to one of more mass-storage devices of the plurality of mass-storage devices, having physical sectors of the first sector length;

wherein the first sector length and the second sector length refer to data-payload lengths of physical sectors (page 5, paragraph 44).

8. With respect to claims 4 and 16, the routing component includes a processor and firmware/software programs that carry out virtual disk formatting (see paragraphs 26 and 44).

9. With respect to claims 5, 6, 17 and 18, virtual sectors are mapped onto contiguous physical sectors (paragraph 44, efficient queuing arrangement to accommodate a 1024 virtual sector with 512 physical sectors suggests contiguous physical sectors), **allowing** the physical sector and byte address of the first byte of a virtual sector to be calculated, when the second sector length is greater than the first sector length (there is no evidence to suggest that address calculation as claimed is prohibited).

10. Claims 1, 13, 7, 8, 12, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Manka (US Patent No. 5,072,378).

11. With respect to claims 1 and 13, Manka discloses a virtual disk formatting system comprising (figure 2):

a plurality of mass-storage devices (figure 2, 211, 212) having physical sectors of a first sector length (figure 10, physical sector); and

a routing component (figure 2) that provides a virtual disk interface to the mass-storage components by routing each access operations, received from external entities, directed to a virtual disk having virtual sectors of a second sector length (figure 10, logical sector) to one of more mass-storage devices of the plurality of mass-storage devices, having physical sectors of the first sector length;

wherein the first sector length and the second sector length refer to data-payload lengths of physical sectors (see figure 10).

12. With respect to claims 7, 12, 19, Manka discloses a virtual disk formatting system comprising:

a plurality of mass-storage devices (figure 211, 212) having physical sectors of a first sector length (figure 10, physical sector); and

a routing component (figure 2) that provides to external entities a first virtual disk interface to the mass-storage components by mapping access operations, received from one of the external entities, directed to the first virtual disk interface having virtual sectors of a second sector length (col. 3, lines 3 – 11, virtual record length, virtual record is the basic unit of storage in the virtual disk storage system, see also figure 9, virtual track format, and col. 18, lines 52 –

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54) to an internal, virtual disk interface with internal-virtual-disk-sectors having a third sector length larger than the second sector length (figure 10, logical sector length $m+n$), and then routing the access operations from the internal, virtual disk interface to one or more of the plurality of mass-storage devices;

wherein the first sector length and the second sector length refer to data-payload lengths of physical sectors (see figures 9 and 10).

13. With respect to claims 8, 9 and 20, see figure 9, see cyclic check field. See also abstract.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 2, 3, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colligan in view of Sanada et al (US Patent Application Publication No. 2002/0083285, hereinafter "Sanada").

Colligan discloses all of the limitations of the parent claims as discussed above. Colligan also discloses ATA disk drives (paragraph 6). However, Colligan does not specifically disclose fibre channel disk based access. On the other hand, Sanada discloses fibre channel storage controller that routes storage traffic among multiple hosts and a storage system (figure 1). It

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would have been obvious to one of ordinary skill in the art, having the teachings of Colligan and Sanada before him at the time the invention was made, to adapt Colligan's storage system for use in a network environment as taught by Sanada, in order to be able to share the storage system among multiple hosts with access security.

16. Claims 2, 3, 10, 11, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manka in view of Sanada and further in view of Surugucchi (US Patent No. 6,928,509).

Manka discloses all of the limitations of the parent claims. However, Manka does not specifically disclose fibre channel disk based access. On the other hand, Sanada discloses fibre channel storage controller that routes storage traffic among multiple hosts and a storage system (figure 1). It would have been obvious to one of ordinary skill in the art, having the teachings of Manka and Sanada before him at the time the invention was made, to adapt Manka's storage system for use in a network environment as taught by Sanada, in order to be able to share the storage system among multiple hosts with access security.

While Manka and Sanada disclose all of the limitations discussed above, they do not disclose ATA disks. On the other hand, Surugucchi teaches that S-ATA provides great value for servers and RAID application because of cost advantages and the ability to hot plug devices (col. 1, lines 50 – 54). It would have been obvious to one of ordinary skill in the art, having the teachings of Manka, Sanada and Surugucchi before him at the time the invention was made, to use S-ATA disks in the system of Manka and Sanada, in order to take advantage of benefits mentioned above.

Response to Arguments

17. Applicants argue that the term “routing” means “directing messages, commands, signals, or packets to one of a number of destinations, or to a destination by one of multiple, possible paths, rather than simply forwarding or transmitting a message, command, signal, or packet to a single entity.” This definition seems self-contradictory, because when a message or command is directed to one of a number of destinations it is forwarded to a single entity (the destination to which the message is directed). Nevertheless, because Applicants’ proposed definition that the term “routing” means directing messages, commands, signals, or packets to one of a number of destinations, or to a destination by one of multiple, possible paths is consistent with the specification, the Examiner will adopt this definition. Accordingly, rejections based on Shinohara are withdrawn because Shinohara disclose only one possible destination or path to a mass storage device.

18. Applicants’ argument with respect to Colligan reference is not persuasive. Applicants argue that there is no virtual disk formatting disclosed by Colligan. The Examiner disagrees. At page 5, paragraph 44, Colligan discloses that in one embodiment the controller will receive data in packet sizes of 1024 bytes. Colligan specifically discloses that “the hard drive, although formatted at a lower sector size, appears to the controller as a hard drive formatted with a higher sector size, i.e., **a virtual hard disk sector size.**” The adoptive hard disk cache arranges reading and writing of the sectors that are queued in such a way that the controller is presented with a virtual sector of size 1024 while the underlying physical sectors are of 512 bytes. As far as the controller is concerned the disk is formatted for 1024 bytes.

19. Applicants' argument regarding Manka focus on alleged one-to-one correspondence between a virtual disk and a physical disk which is supposedly claimed by the language "mapping each access ..." While this argument doesn't seem persuasive, because the language seems to allow for general m to n mapping or correspondence, it need not be address because the "mapping" limitation has been removed from the claims.

20. As to Applicants arguments regarding claims 7 and 19, Applicant has not addressed the rejection. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Conclusion

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Woo H. Choi whose telephone number is (571) 272-4179. The examiner can normally be reached on M-F, 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Woo H. Choi
August 17, 2007